

# Maritime Transport in the Arctic after the Introduction of the Polar Code: A Discussion of the New Training Needs

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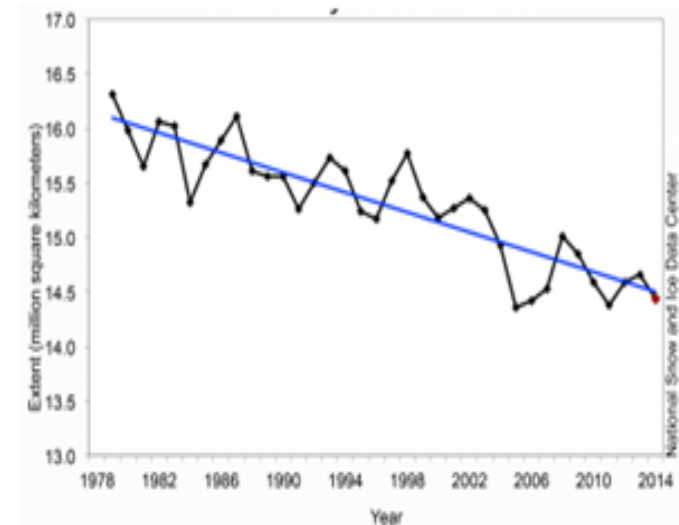
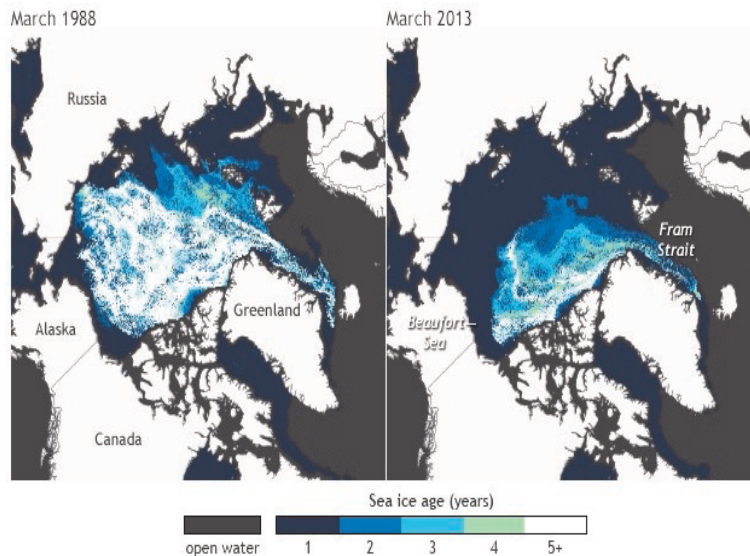
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# “Rising” Arctic

- **Climate** change
  - Global **warming** – Ice melting
- The Arctic is coming to the **forefront**

Sea ice age in  
1988 and 2013



Average Monthly Arctic Sea Ice Extent,  
February 1979-2014

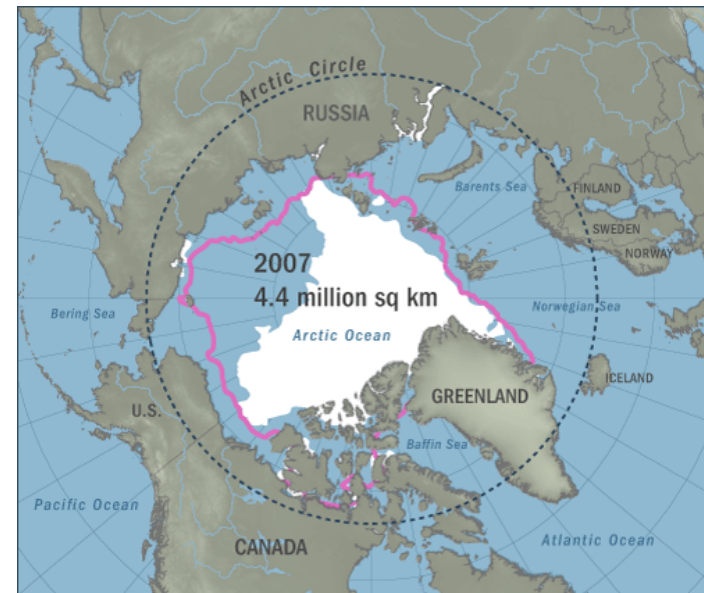


# Defining the Arctic



# Defining the Arctic

- “Above” the Arctic circle
  - Harsh environmental conditions
  - Inadequate infrastructure & communications
  - Sparsely populated
- 
- Claims & Geopolitical tensions
  - Shipping: new Arctic passages



# Commercial interest

Contemporary world: interconnected societies

**Globalization!**

- **Shipping:** by far the **most international** of the world's industries
  - Well over **80%** of all international trade transported by **sea**
- Maritime transport should be considered as the **backbone** of globalization



A background image of a blue, cracked ice surface, likely from the Arctic region, with a dark, winding line across it.

# Arctic Routes

- **Northeastern Passage (NEP)**

- **Northern Sea Route (NSR)**, along the northern Russian coastline
- alternative to the Suez Channel, 40% shorter through the Indian Ocean.
- icebreaker escort
- during 2014 less than 1.5 million tons of freight were traded through this route (mostly local traffic)

- **North West Passage (NW Passage)**

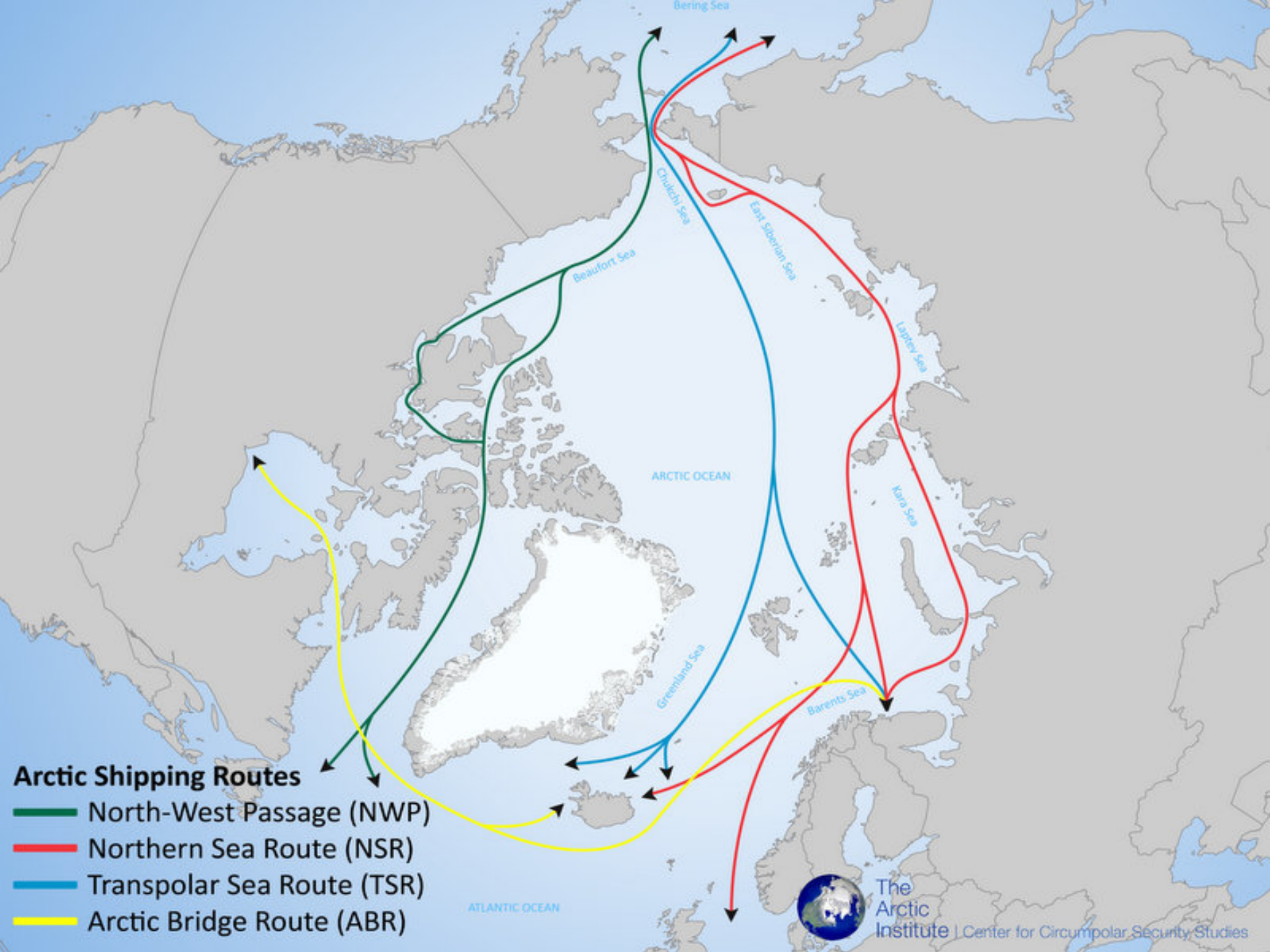
- through the Canadian Arctic Archipelago
- alternative for the Panama Canal

- **Arctic Bridge (ABR)**

- Planned to connect Canada & Russia (Churchill – Murmansk)

- **Central Arctic Route or Transpolar Route (TPR)**

- Straight line through the Arctic Ocean
- far from feasible at the moment



**Arctic Shipping Routes**

- North-West Passage (NWP)
- Northern Sea Route (NSR)
- Transpolar Sea Route (TSR)
- Arctic Bridge Route (ABR)



A background image of a blue, cracked ice surface, likely from the Arctic region, with a dark, winding line representing a crack or a narrow waterway.

# Arctic Shipping

**Arctic: delicate ecosystem & very complex environment**

## **Advantages**

- Avoid heavily congested straits, less pressure on the main transcontinental routes
- Shorter routes, less time needed per journey, fuel saving
- Reduced transport cost - reduced final price
- emissions are less
- Avoid piracy prone areas

Easier passenger and freight access at almost any part of the globe.

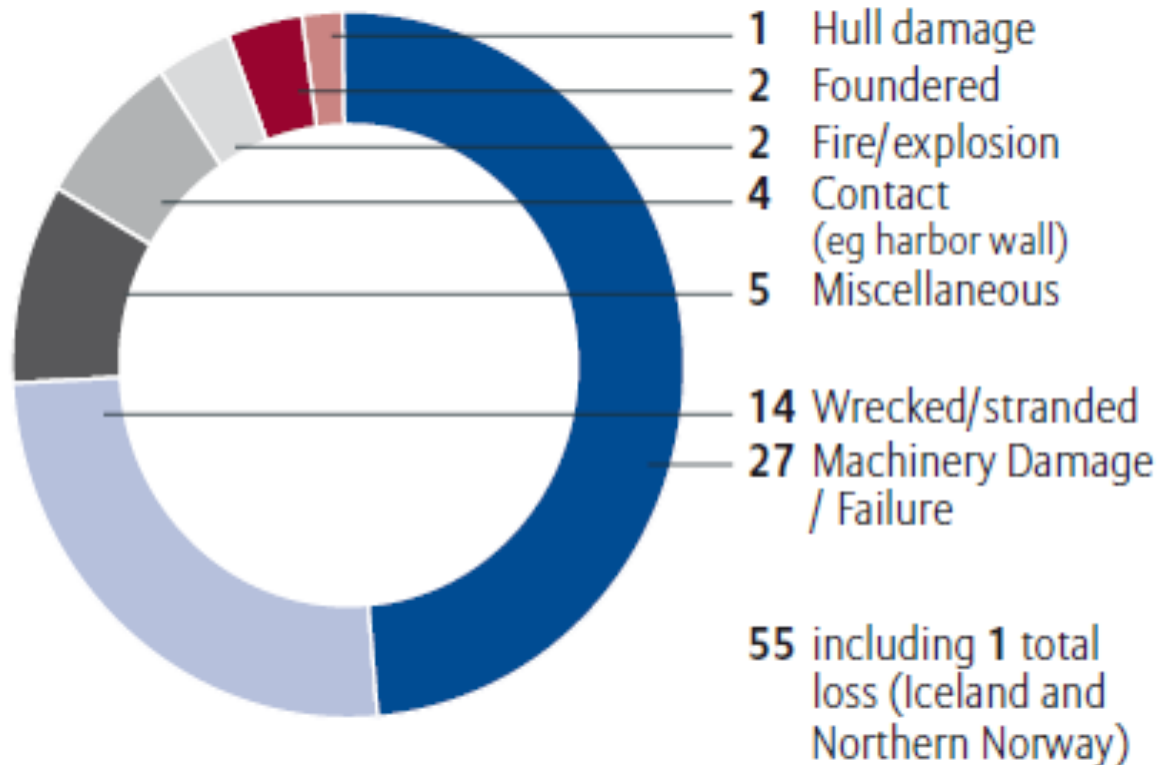
## **Disadvantages**

- Increase: unrecorded ice floes
- Adverse navigating conditions (extreme cold, polar night, winds)
- Limited time frame for use
- Icebreaker escort
- Unpredictable
- Inadequate maritime traffic management (SAR?)
- Inadequate nautical charts
- High insurance rates
- Great difficulty in potential oil spill cleaning
- Big investments needed (infrastructures, ice-breakers)



# Shipping remains perilous

Arctic Circle Waters, all casualties (including total losses )**2014**



Source:  
Adaptation  
from Safety  
and  
Shipping  
Review  
2015, p. 15.



# IMO action

- Enhance safety for the seafarers and the environment
- Introduction of the **Polar Code**
- Revision of STCW, SOLAS, MARPOL
- Important steps by Arctic Council
  - Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic
- Arctic Monitoring and Assessment Program (AMAP) Working Group

# WHAT DOES THE POLAR CODE MEAN FOR SHIP SAFETY?

## EQUIPMENT



**WINDOWS ON BRIDGE**  
Means to clear melted ice, freezing rain, snow, mist, spray and condensation



**LIFEBOATS**  
All lifeboats to be partially or totally enclosed type



**CLOTHING I**  
Adequate thermal protection for all persons on board



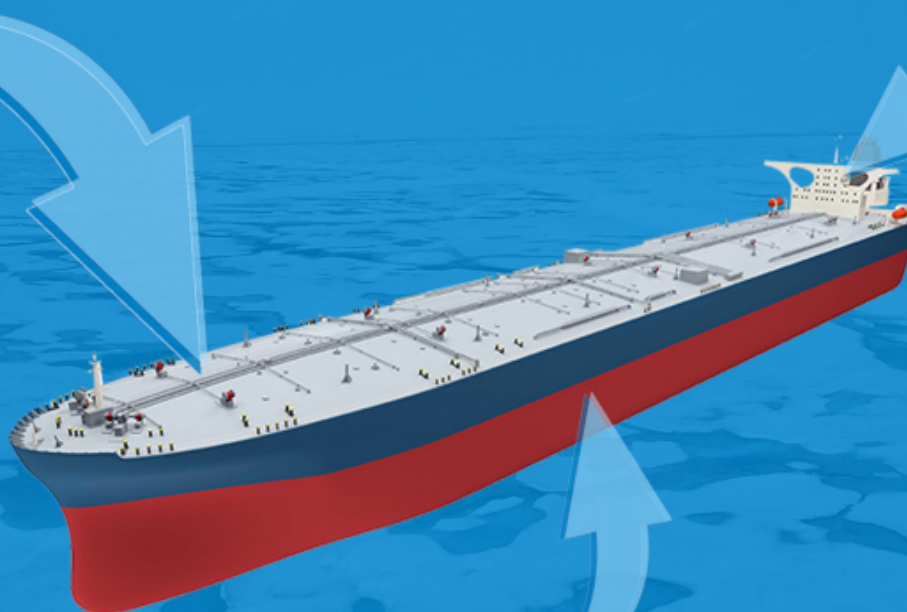
**CLOTHING II**  
On passenger ships, an immersion suit or a thermal protective aid for each person on board



**ICE REMOVAL**  
Special equipment for ice removal: such as electrical and pneumatic devices, special tools such as axes or wooden clubs



**FIRE SAFETY**  
Extinguishing equipment operable in cold temperatures; protect from ice; suitable for persons wearing bulky and cumbersome cold weather gear



## OPERATIONS & MANNING



**NAVIGATION**  
Receive information about ice conditions



**CERTIFICATE & MANUAL**  
Required to have on board a Polar Ship Certificate and the ship's Polar Water Operational Manual



**TRAINING**  
Masters, chief mates and officers in charge of a navigational watch must have completed appropriate basic training (for open-water operations), and advanced training for other waters, including ice

## DESIGN & CONSTRUCTION



**SHIP CATEGORIES**  
Three categories of ship which may operate in Polar Waters, based on:  
A) medium first-year ice  
B) thin first-year ice  
C) open waters/ice conditions less severe than A and B



**MATERIALS**  
Ships intended to operate in low air temperature must be constructed with materials suitable for operation at the ships polar service temperature



**INTACT STABILITY**  
Sufficient stability in intact condition when subject to ice accretion and the stability calculations must take into account the icing allowance



**STRUCTURE**  
In ice strengthened ships, the structure of the ship must be able to resist both global and local structural loads

## BACKGROUND INFO



THE INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS WAS ADOPTED NOVEMBER 2014 BY THE IMO MARITIME SAFETY COMMITTEE



IT APPLIES TO SHIPS OPERATING IN ARCTIC AND ANTARCTIC WATERS



THE AIM IS TO PROVIDE FOR SAFE SHIP OPERATION AND THE PROTECTION OF THE POLAR ENVIRONMENT BY ADDRESSING RISKS PRESENT IN POLAR WATERS AND NOT ADEQUATELY MITIGATED BY OTHER INSTRUMENTS



# Latest Developments in IMO

*The MEPC met for its 68th session from 11 to 15 May 2015, at IMO Headquarters in London where the environmental provisions of the **Polar Code** adopted.*

Ships trading in the Polar Regions will have to comply with strict safety and environmental provisions specific to the harsh conditions in the Arctic and Antarctic, following the adoption of the environmental part of the International Code for ships operating in polar waters (Polar Code) and associated MARPOL amendments to make the Code mandatory by the Marine Environment Protection Committee (MEPC) of IMO.

The Polar Code covers the full range of design, construction, equipment, operational, training, search and rescue and environmental protection matters relevant to ships operating in waters surrounding the two poles.

The newly-adopted environmental provisions cover:

- Prevention of pollution by oil: discharge into the sea of oil or oily mixtures from any ship is prohibited. Oil fuel tanks must be separated from outer shell;
- Prevention of pollution by noxious liquid substances: discharge into the sea of noxious liquid substances, or mixtures containing such substances is prohibited;
- Prevention of pollution by sewage; discharge of sewage is prohibited unless performed in line with MARPOL Annex IV and requirements in the Polar Code; and
- Prevention of pollution by garbage: discharge of garbage is restricted and only permitted in accordance with MARPOL Annex V and requirements in the Polar Code

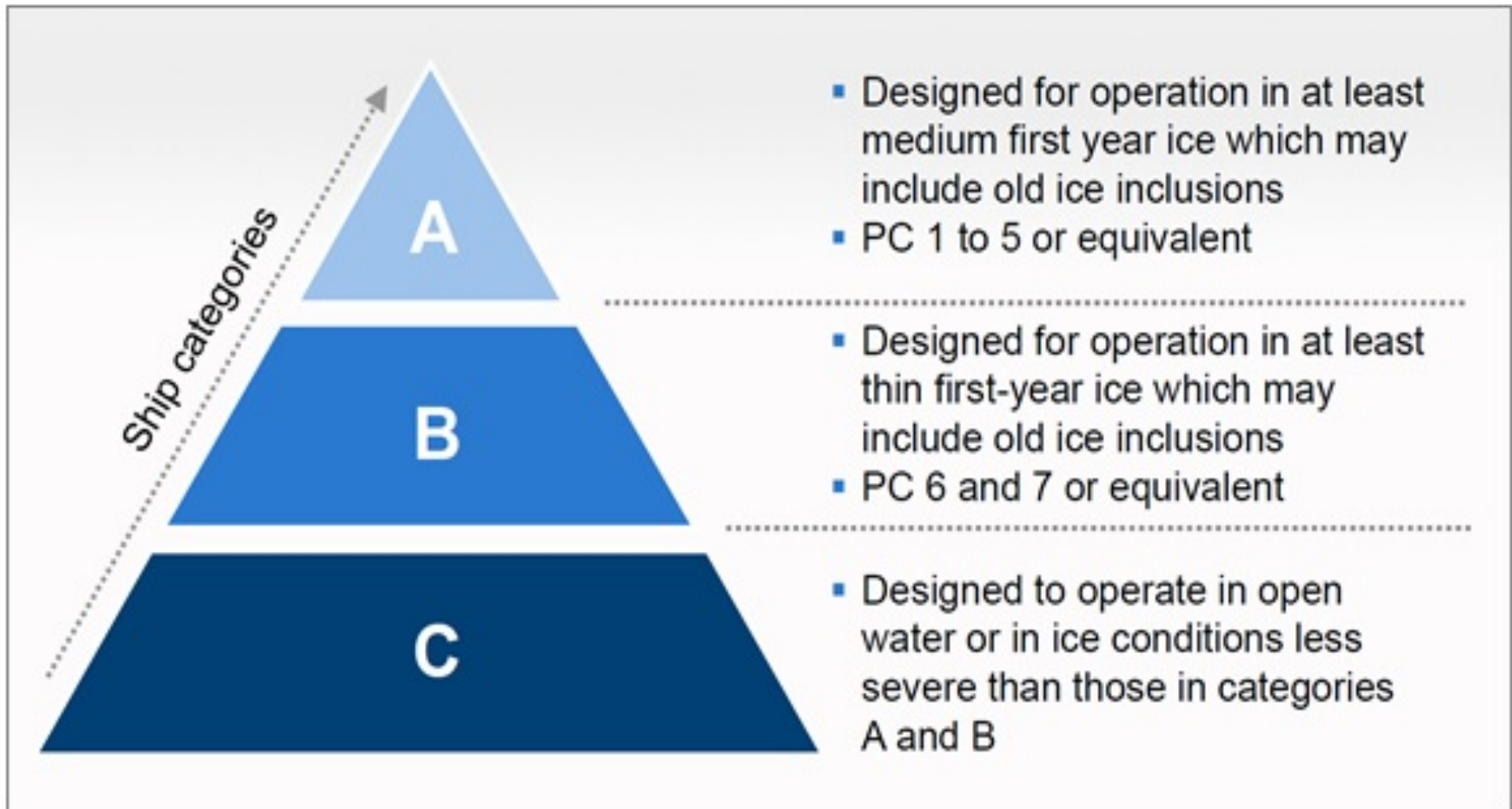
The adoption of the environmental provisions follows the adoption, by the **Maritime Safety Committee (MSC)**, in **December 2014**, of the **safety-related requirements of the Polar Code** and related amendments to make it mandatory under the International Convention for the Safety of Life at Sea (SOLAS).

The complete Polar Code, encompassing the safety-related and environment-related requirements, is expected to enter into force on 1 January 2017.

The Polar Code will apply to new ships constructed on or after 1 January 2017. Ships constructed before that date will be required to meet the relevant requirements of the Polar Code by the first intermediate or renewal survey, whichever occurs first, after 1 January 2018.



# Ship categories with respect to ice conditions



# Polar Class vessels as defined by IACS in 2006

Polar class	Ice description
PC 1	Year-round operation in all Polar waters
PC 2	Year-round operation in moderate multi-year ice conditions
PC 3	Year-round operation in second-year ice which may include multiyear ice inclusions.
PC 4	Year-round operation in thick first-year ice which may include old ice inclusions
PC 5	Year-round operation in medium first-year ice which may include old ice inclusions
PC 6	Summer/autumn operation in medium first-year ice which may include old ice inclusions
PC 7	Summer/autumn operation in thin first-year ice which may include old ice inclusions





# Training Needs

- Tackle limited polar experience
- STCW – Chapter V amendment (Feb. 2015)
- Basic Certificate
- Advanced Certificate of Proficiency  
(Basic + seagoing service)
- Mandatory around **2020** (for everyone)
  - Revalidation every 5 yrs



# Training - Familiarization

Basic knowledge:

- Ice characteristics – ice location (area, thickness)
- Vessel performance in cold & ice
- Safe operation and sailing in ice conditions



# Training needs

Without what follows providing a complete solution, at least the following must be included: a) basic knowledge of ice characteristics and predicting different types of ice in the area of operation b) basic knowledge of vessel performance in ice and cold climate c) basic knowledge related to how safely operate and steer a ship in ice.

As an immediate step towards that direction, integrating the use of ice navigation simulators in the pre-deployment phase of any navigating officer in the Arctic would be very helpful in order to have a first contact with these extreme/strange conditions in a controlled and safe environment.

Theoretical knowledge alone is not sufficient to be able to handle the extreme polar navigation conditions. Preparatory training courses could also provide vital information to crews and through them, to passengers, about how to use survival equipment and things to do when in distress in the Polar waters.



# Training needs

- If you operate in polar waters, IMO regulations clearly stipulate that you must provide survival suits for everyone on board.
- And these regulations are very specific about the minimum requirements for those suits.
- But are those requirements tight enough, or do they set the bar too low?



Crewmembers must be able to put the suits on unassisted in 2 minutes or less, in temperatures as low as -30 degrees Celsius.

2 minutes may sound like a lot of time, but it really depends on the reason you're abandoning your ship. If your ship is steadily taking on water, 2 minutes may be plenty.

But if there's been an explosion and a resulting fire, it might not be nearly enough. So, a difference of just a few seconds could determine your chances of survival.

# Concluding Thoughts

No major  
climatic shift

Increased Arctic  
traffic

Forefront of  
global  
commerce

- Numerous actors motivated to become involved
  - Shipping routes
  - Fisheries
  - Energy resources
  - Minerals

# Concluding Thoughts

- Great need for regulations-Focus on practicalities!
- What is a well trained personnel?
- Forming regime:
  - Polar Code
  - STCW amendments(Introduction of various tailored-made courses!)
  - SOLAS
  - MARPOL
  - Arctic Council?(maybe conduct of a SAR exercise with all stakeholders involved!)





Thank you very much for your  
attention!

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Questions?

